

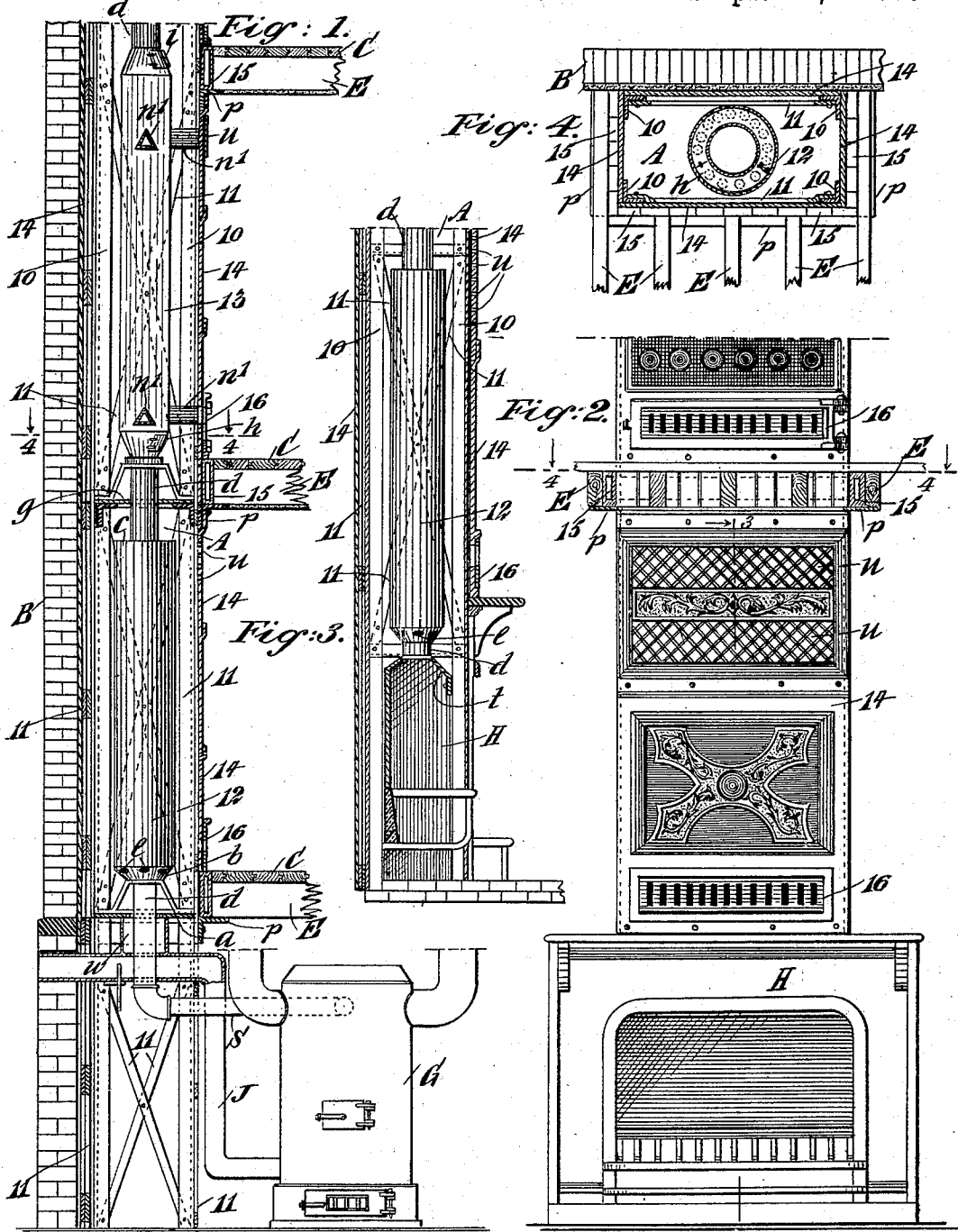
(No Model.)

LE ROY C. HEDGES.
CHIMNEY.

3 Sheets—Sheet 1.

No. 580,691.

Patented Apr. 13, 1897.



WITNESSES:

Wm. P. Patton
Herbert A. Thorpe

INVENTOR
Le Roy C. Hedges
BY *Munn & Co.*
ATTORNEYS.

(No Model.)

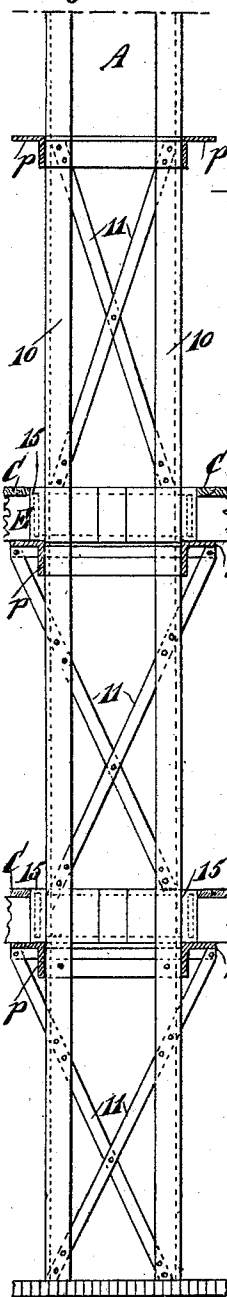
3 Sheets—Sheet 2.

LE ROY C. HEDGES.
CHIMNEY.

No. 580,691.

Patented Apr. 13, 1897.

Fig: 5.



WITNESSES:

Wm. Patton

Herbert A. Thorpe

Fig: 8.

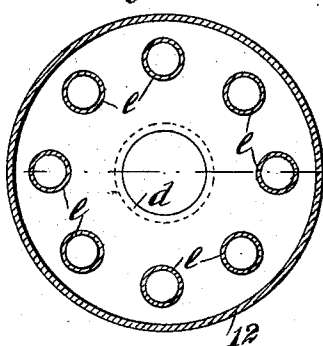


Fig: 6.

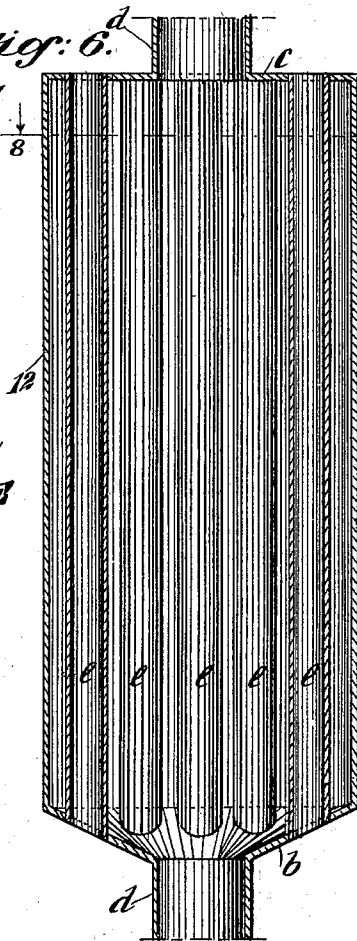


Fig: 9.

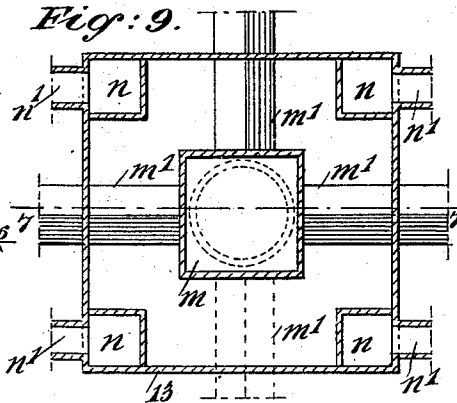
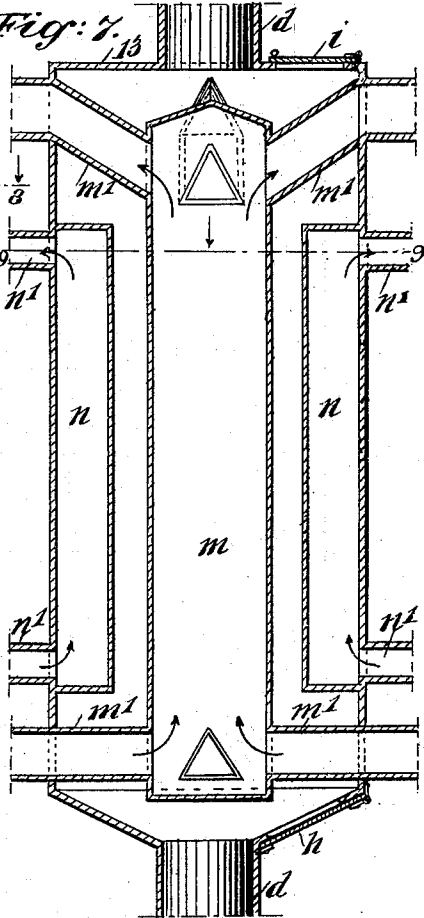


Fig: 7.



INVENTOR

Le Roy C. Hedges

BY

Munn & Co

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

LE ROY C. HEDGES.
CHIMNEY.

No. 580,691.

Patented Apr. 13, 1897.

Fig: 10.

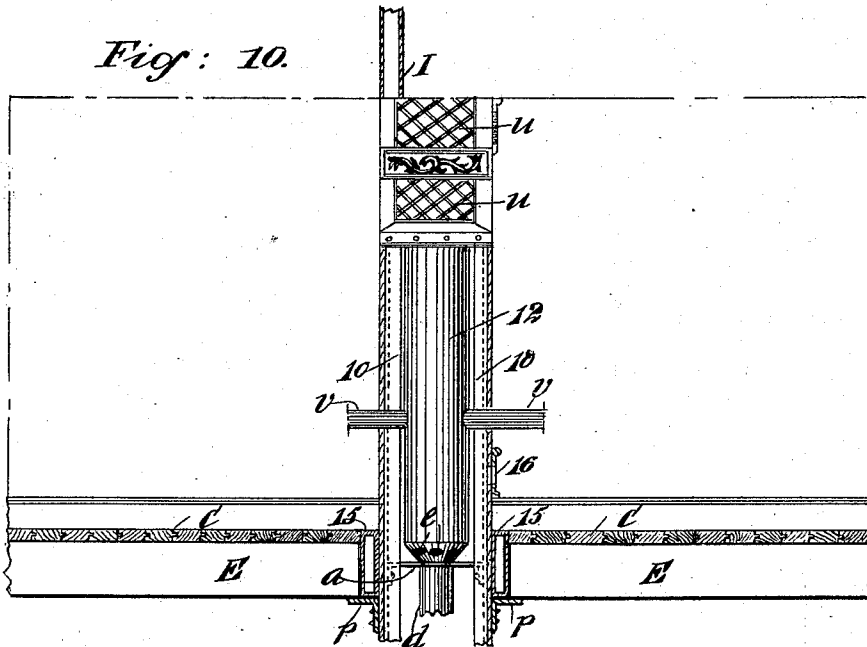
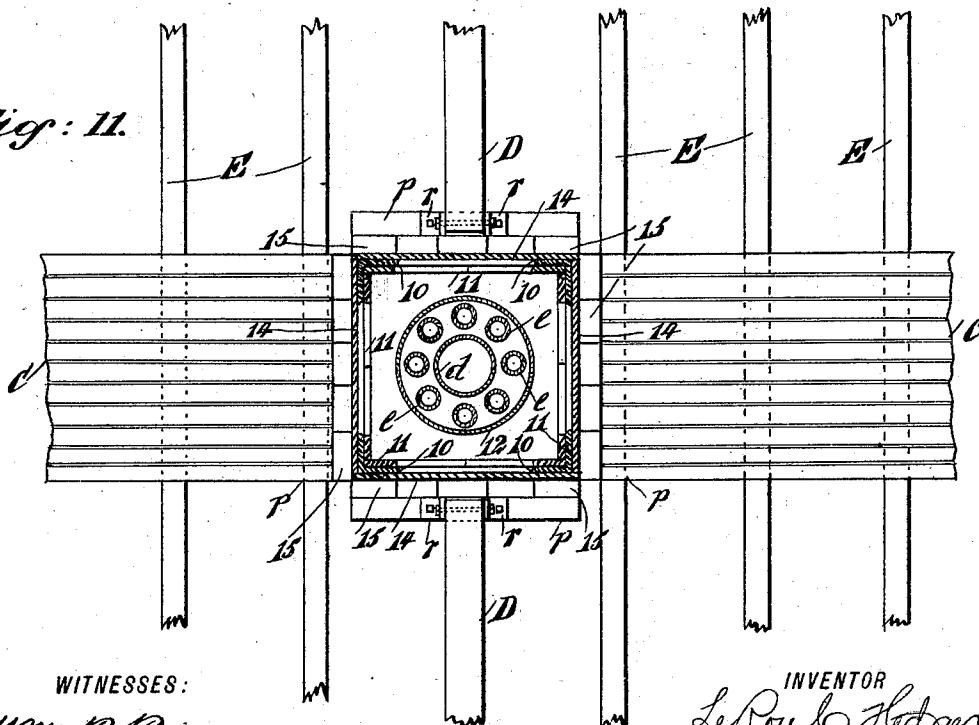


Fig: 11.



WITNESSES:

Wm I Patton
Herbert A. Thorpe

INVENTOR

Le Roy C. Hedges
BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

LE ROY C. HEDGES, OF ELMWOOD, ILLINOIS.

CHIMNEY.

SPECIFICATION forming part of Letters Patent No. 580,691, dated April 13, 1897.

Application filed December 10, 1895. Serial No. 571,660. (No model.)

To all whom it may concern:

Be it known that I, LE ROY C. HEDGES, of Elmwood, in the county of Peoria and State of Illinois, have invented a new and Improved Chimney, of which the following is a full, clear, and exact description.

This invention relates to chimneys for buildings, and particularly for dwelling-houses, and has for its objects to provide a metal-framed chimney which will be light, very strong, be ornamental, be adapted to afford support to and strengthen other structural portions of the building, and afford a fire-proof chimney which is cheap to construct and easy of access to all parts for repair, if necessary.

A further object is to furnish a metallic chimney which is capable of saving a large proportion of the heat that is contained in waste products of combustion that pass up ordinary chimneys without useful effect, this conservation of heat being so produced that an even distribution of warmed air is afforded throughout rooms of a building having the improvements and connected therewith.

The invention consists in the construction and combination of parts to be hereinafter described, and indicated in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional elevation of a building in part and of the improved chimney located therein. Fig. 2 is a front elevation of the improvements adapted for use in connection with an open fireplace. Fig. 3 is a sectional side elevation of the chimney and fireplace shown in Fig. 2, substantially on the line 3 3 in said figure. Fig. 4 is a transverse sectional view, substantially on the line 4 4 in Figs. 1 and 2. Fig. 5 is a front view in part of the chimney-frame shown in connection with floors of a building. Fig. 6 is an enlarged detached sectional elevation of a portion of the draft-flue and heat-radiator of the improved chimney. Fig. 7 is a sectional side elevation of another enlarged portion of the heat-conserver and draft-flue on the line 7 7 in Fig. 9. Fig. 8 is a transverse sectional view essentially on the line 8 8 in Fig. 6. Fig. 9 is a transverse sectional view on the

line 9 9 in Fig. 7. Fig. 10 is a partly sectional side view of a portion of the improved chimney, showing one position it may be given in a building with regard to adjacent rooms therein; and Fig. 11 is a plan view of a building-floor in part and a sectional plan view of the improved chimney, showing means for supporting the floor therefrom and protecting said floor from heat that may be radiated from the chimney.

The improved chimney is adapted for erection in buildings of brick, stone, or framed-wood construction, and consists, essentially, of two main portions, namely, a light strong metallic frame of suitable dimensions, and a draft-conduit that is located within and is sustained by the frame; and the said features of the improved chimney may be utilized to receive waste products of combustion thrown off from fuel burned in stoves, ranges, furnaces, or open fireplaces, and conserve the major portion of heat pervading said waste products, as will appear from the description of parts that will now be given.

The frame of the chimney will first be considered, and this feature of the improvement as an entirety is designated by the letter A throughout the drawings.

As represented and preferably formed the structure A comprises an upright frame consisting of four angle-iron posts 10, that are the corners of said frame and are held spaced apart a suitable degree by light strong metal braces 11, that stiffen the structure also. It may be premised that the frame A may receive other forms in cross-section than that illustrated, depending on the situation it is to occupy in a building, but generally it is considered preferable to render the chimney-frame rectangular, and it is so shown in the drawings.

The braces 11 may with advantage be composed of flat metal strips that in pairs are diagonally crossed to afford an X-like formation, having ends of the same secured on the upright posts 10, either on the outer or inner surfaces of the latter.

Any suitable number of the braces 11 are provided which are located on opposite sides of the frame, extending from the base to the top of the metal frame A, and said braces may be placed on two opposite sides of the frame, or,

if considered necessary, on all sides of the same.

The frame A is seated on a fixed foundation in the cellar of the building or on the ground if there is no cellar provided for the house, and when in position is vertical and self-supporting, but may be connected with the house-walls, as will hereinafter be explained.

The frame A may be placed in contact or near a brick or stone side wall of the building, so as to project therefrom into a room or tier of rooms throughout the height of the chimney, as indicated in Fig. 1, or the latter may occupy a position within the house at intersecting partition-walls, as represented in Figs. 10 and 11.

The heat-conserving draft-flue that is an important feature of the invention consists, essentially, of one or more hollow portions which are sustained upright in the frame A, which affords support therefor.

For convenience in manufacture and placing of the draft-flue as a complete structure it is generally formed of sections that may have such a length as will permit each section to extend between floors of rooms that are adjacent to the chimney and which are to be partially warmed by heat radiated therefrom.

There may be and preferably are two forms of flue-sections provided which are somewhat different in construction, and both of said forms for the flue-sections may be used in a chimney of the improved construction, or either form, as may be preferred.

Referring to Figs. 1, 6, and 7, where both forms of the draft-flue chambers are shown, it will be seen that the lower chamber 12 is cylindrical and coniform at the lower end, the said chamber being supported by a skeleton frame that in turn rests on a flat diaphragm-plate *a*, which is secured at its corners to the inner sides of the posts 10. The shell of the chamber 12 is preferably formed of plate or sheet metal, and is mainly closed at the ends by a dished lower head *b* and a flat upper head *c*. A tubular neck *d* extends from the center of each head *b c* in opposite directions, these necks forming portions of the draft-flue.

A number of air-tubes *e* have their ends affixed in the heads *b c*, occupying space that intervenes the shell of the chamber 12, and necks *d* thereon, said tubes from their position being adapted to afford a series of air-passages extending longitudinally through the chamber mentioned.

The chamber 12, which, as represented, occupies space in the frame A between the first and second floors of the building, has its upper neck *d* extended through a diaphragm or base-plate *g*, that is secured within the frame A near the second floor of the building, and on a stool-frame or equivalent device that rests on plate *g* another elongated chamber 13 is sustained in an upright position within the chimney-frame.

Chamber 13 is preferably formed as shown in Figs. 1, 7, and 9, having a rectangular-contoured shell that is contracted at the lower end, wherein a door *h* is placed for access to the interior of neck *d* on chamber 12 for the purpose of introducing a flue-brush to remove soot from the interior of the latter.

The upper end of the chamber 13 may be coniform, as shown in Fig. 1, or be made flat, as represented in Fig. 7, and in either case a door *i* is provided therein to afford access to the interior of the chamber through its upper end wall. The upper end wall of the chamber 13 is centrally apertured for reception of a neck-piece *d* similar to those on chamber 12 and forming an extension of the rectangular chamber, which neck may enter a third chamber if the building has three stories. It may be here stated that any suitable number of connected chambers 12 or 13, or these alternated, are to be provided to form a complete draft-flue for the improved chimney, the upper end of which, being projected beyond the roof of the building, may be protected in any preferred manner which will not vitiate its function as a smoke-conduit and draft-passage for heating devices within the building.

The interior of chamber 13 is preferably constructed as shown in Figs. 7 and 9, consisting of an elongated main air-heating receptacle *m*, that may be rectangular or otherwise formed, said compartment being held in position at or near the center of the outer shell of the chamber by the hollow outlet and inlet air-conduits *m'*, these latter tapping the compartment *m* and thence extending through the shell of the chamber 13.

Preferably the conduits *m'* are radially extended to pass through three or possibly four sides of the shell of the chamber 13 at points near the upper and lower heads of said shell, which will adapt the said conduits to receive and discharge air from without the space inclosed by the frame A.

If the outer wall of the chamber 13 is rectangular, it is preferred to locate an auxiliary heating-compartment *n* at each corner of the said shell, which compartments are smaller than the main central compartment *m*, and in like manner each has an air-inlet conduit *n'* at its lower end and an air-exit conduit *n'* at or near its upper end, which passages for air extend through the shell of the chamber 13.

On the exterior of frame A casing-plates 14 are secured so as to be removable, and at points where portions of said plates are exposed to view in rooms of the building they are rendered ornamental, preferably by casting the plates and producing the ornamental effects on the surfaces of the plates that are outermost when they are in position on the frame A.

The casing-plates 14, that are near to and opposite an upright brick or stone wall B of a building, may be thereto secured, if desired, by any suitable means, and, as indicated in

Fig. 1, the braces 11, that are close to and parallel with such a building-wall, may be and preferably are outwardly extended at their upper ends to be attached to transverse brace-pieces, whereby increased stability is afforded the frame A, the said braces being concealed by plastering or other facing of the room-walls.

The floors C of the building, through which the chimney-frame A projects upwardly, are not in direct contact with the casing-plates 14, as this might endanger their catching fire, and it is a feature of the improvements to adapt the chimney-frame A to afford reliable and safe support for the ends of joists or stringer-timbers of the house-frame, which extend transversely and horizontally for reception of the flooring of rooms in the same. To this end there are a suitable number of angle-iron bracket-pieces *p* secured on the outer sides of the frame-posts 10 at such points as will permit the horizontal members of such brackets to afford shelves, whereon hollow tiles 15 or other suitable heat non-conductors may be closely placed around the frame and ends of the stringers, such as D, and joists E may rest on the said shelves outside of and in loose contact with the tiles or equivalent non-conductor of heat, as clearly shown in Figs. 1, 4, 5, and 11.

It is of advantage to use tiles 15 having such relative proportions as will adapt the upper ends of said tiles to intervene the flooring C and casing-plates 14 on the chimney-frame, as this will prevent contact of the wooden flooring with the plates named, and thus preserve the flooring from heat that may radiate from said plates.

When it is desired to utilize the chimney-frame A as a medium for stiffening and supporting the house-frame at different points of height, the stringers or beams D may have their ends that rest on the bracket-pieces *p*, being secured thereto by providing knee-plates *r*, which are attached by their horizontal members to the shelves of the bracket-plates and have their upright members held oppositely and in close contact with sides of the beams named by bolts, as clearly indicated in Fig. 11.

The neck-piece *d* that projects downwardly from the lower end of the chamber 12 may receive the waste products of combustion from a furnace G, situated in the cellar of the building having the improvements, by connection of a draft-pipe S to the neck-piece and furnace, as shown in Fig. 1.

The improved chimney may also be employed as a draft-flue for an open fireplace H, as shown in Figs. 2 and 3. In this case the lower neck-piece *d* is seated on and is in connection with an upwardly-converging throat-funnel *t*, which latter is thus adapted to convey all waste products thrown off by burning fuel in the grate into the neck *d* and thence upward through the several chambered sections of the improved draft-flue.

In the portions of the casing-plates 14 that are exposed in rooms of the building registers 16 are preferably placed which are as close to the floor as permissible, said registers being designed to graduate the passage of cold air from lower portions of the rooms into the space surrounding the draft-flue in the cased chimney-frame A.

Preferably the registering devices 16 are made removable or may be hinged so as to swing away and open apertures in the plates 14 for free admission to the doors in the sections 12 13 of the draft-flue, so that a cleaning device for the interiors of said sections may be readily inserted and manipulated through the apertures and doors mentioned.

For efficient service the upper end of the head-space surrounding the draft-flue of the improved chimney should be closed by a closely-fitting diaphragm-plate through which an upper neck-piece *d* of the draft-flue passes, which will prevent an improper escape of heated air from the chimney.

Near the ceiling of each room that is in connection with the improved chimney the casing-plates 14 are perforated sufficiently for the inflow of hot air to the rooms, such numerous perforations being most clearly shown at *u* in Figs. 1, 2, 3, and 10.

As before mentioned, the improved chimney may be introduced as part of a partition-wall I, that separates adjacent rooms, as shown in Fig. 10, and the chimney may in such a case project laterally into one of the adjoining rooms on the same floor-level and have one side flush with the partition-wall in the other room, or the chimney may obviously be projected equally in each of the adjacent rooms, if preferred.

In case it is necessary to direct the products of combustion from stoves located in rooms of a building that are heated therewith into the draft-flue of the improved chimney this can be readily effected by laterally-extending draft-pipes for such stoves from the shells of the chambers 12 or 13 into such rooms, as shown at *v* in Fig. 10.

In operation heat-currents from a furnace G may be partly used to heat rooms through which the chimney passes or has a side exposed therein and the remainder of heat-supply for such rooms be furnished by the radiation of heat from the chambers 12 or 13 of the draft-flue and its permeation of the air that circulates in the chimney-space around the said chambers and through them, the cold air entering said space and the chambers in their lower portions and passing therefrom into the rooms near ceilings of the latter, whereby an equally-warm temperature is afforded for rooms that are connected with the improved chimney, as hereinbefore explained. It will also be evident that the metal casing-plates 14 will become heated and will be adapted to throw off heat into rooms wherein such plates are exposed, which will further aid to heat the rooms through

which the chimney passes. Hence it is apparent that a less amount of fuel consumption will be needed to heat a building having the improvements, as the portion of heat evolved by the furnace G or like heating device may be utilized to heat other rooms of the building not adjacent to the chimney.

Where an open fireplace is used, great waste of fuel ordinarily occurs, as the products of combustion from fuel burned in the grate usually go directly up the chimney and are lost, but if the improved chimney is substituted for the common brick chimney heat that is wasted by absorption of the bricks or by direct draft up the chimney is in a large measure conserved for useful heating purposes by means already described with regard to the furnace-heat medium.

Furnaces are generally arranged to heat air introduced from without the building, so as to insure a proper supply of pure air, and such an arrangement is shown in Fig. 1, where it will also be seen that if desired a portion of the inducted pure air may be upwardly directed through a branch *w* of the air-induction pipe *J*, and thence through perforations in the base-plate *g* into the heat-space of the chimney surrounding the draft-flue, so that a certain proportion of fresh air may thus be commingled with the air that circulates from rooms through the heat-space of the improved chimney.

It will be seen from the foregoing description that the novel constructed chimney is light, strong, safe, fireproof, and ornamental; serves as a support for walls of a building, and is a positive fuel-saver as well as a practical and effective heat-distributor for rooms of a building that are directly connected therewith.

Slight changes in the forms of portions of the improved chimney may be made within the scope of my invention—as, for example, the posts of the chimney-frame may be formed of solid bars or produced of strips that are not in angle-iron form, the design of the ornamentation on the casing-plates 14 may be changed, and registers may be dispensed with, substituting perforations of the said plates in their lower portions. Also, vertical air-passages may be otherwise formed in chamber 12 than by the use of cylindric tubes and the same useful effect be obtained. Hence I do not limit the construction of such mentioned parts to the exact shapes and formation shown, reserving the right to vary somewhat therefrom within the scope of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A chimney, comprising a casing having openings near the floor and ceiling of each

compartment, and a draft-flue and heat-radiator arranged in the casing and through which the products of combustion pass, said flue and heat-radiator being provided with a central air-passage having inlets and outlets leading through the sides of the flue into the said passage, and corner air-passages also having inlet and outlet openings leading through the sides of the flues, substantially as described.

2. A chimney, comprising a casing having openings for the admission and escape of air near the floor and ceiling of the compartments, a draft-flue and heat-radiator within the casing and provided with a series of air-flues leading therethrough, and a second draft-flue and heat-radiator connected to the first draft-flue and provided with a central air-chamber having inlet and outlet openings leading through the sides, and corner air-passages also having inlet and outlet openings leading through its sides, the said flues each being of a length about equal to the distance apart of the floors of a building, substantially as described.

3. The combination with a chimney, comprising a casing, and a draft-flue arranged therein, of brackets secured to the outer surface of the casing for supporting the joists and the like, and tiles on the brackets, said tiles being of such a size as to intervene the casing and the ends of the joists and floor supported thereby, substantially as described.

4. The combination with a chimney, comprising a casing, and a draft-flue arranged therein, of brackets secured to the outer surfaces of the casing for supporting the joists and the like, knee-plates on the brackets, and tiles on the brackets between the ends of the joists and the casing, said tiles being of such a size to also intervene the floor supported by the joists, substantially as described.

5. In a chimney, the combination with a frame upright in a building, and exposed at its sides within rooms of said building, the frame having casing-plates on the exterior, which plates are perforated near ceilings of said rooms, and provided with registers near floors of the rooms, of a draft-flue supported within the cased frame, and composed of chambers connected in sequence by hollow necks, said chambers being of a length about equal to the distance apart of the floors of the building and having longitudinal air-passages adapted to receive air from the rooms through the registers, the air escaping from the perforations of the casing-plates after receiving heat from the flue-chambers, substantially as described.

LE ROY C. HEDGES.

Witnesses:

WILLIAM CHRISTY,
NILES J. COURLY.